



Single Taxon Treatment

The northernmost record of a blood-sucking ectoparasite, *Lipoptena fortisetosa* Maa (Diptera: Hippoboscidae), in Estonia

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Abstract

Background

Deer keds are obligatory haematophagous parasites of large homeothermic animals, particularly cervids. Two of the five known species occurring in Europe—*Lipoptena cervi* (Linnaeus) and *L. fortisetosa* Maa—are known to have a relatively wide distribution. *Lipoptena fortisetosa* is considered to have been introduced into Europe with sika deer from the Eastern Palaearctic and is continuously expanding its range. Little is known about the medical importance of deer keds, but they can cause hair loss in cervids and are suspected to be vectors of several diseases.

New information

Details of the distribution of *Lipoptena fortisetosa* in Europe, including its northernmost record, are provided. This species has been shown to have a viable population in Southern

Estonia. Furthermore, the differences from allied *L. cervi* are discussed, based on morphological and molecular characters.

Keywords

Diptera, DNA barcode, Hippoboscidae, deer keds, distribution, range expansion

Introduction

Deer keds (Insecta: Diptera: Hippoboscidae: *Lipoptena* spp.) parasitise wild as well as domestic animals, being most often associated with Cervidae and have been known to occasionally attack humans. Their medical impact is only superficially known, but as shown quite recently, deer keds are potential vectors of several diseases, for example, those caused by *Bartonella* spp., *Coxiella* spp. and *Rickettsia* spp. (Hornok et al. 2011, Lee et al. 2016, Szewczyk et al. 2017, Regier et al. 2018). Therefore, precise species identification, distribution details and bionomics are of utmost importance from the animal and human health perspective and imperative for vector control. There are 30 *Lipoptena* species known worldwide (Dick 2006), including five species recorded from Europe (Petersen 2013). Three of the five species have a restricted distribution in Southern Europe, including the Mediterranean islands, while *L. cervi* (Linnaeus, 1758) and *L. fortisetosa* Maa, 1965 have a more northern range (Petersen 2013). Having been described from Honshu Island in Japan (Maa 1965), *L. fortisetosa* has been subsequently widely reported from the Eastern Palaeractic (e.g. Dozanov 2003). In Europe, the species was first recorded from Czech Republic where it was initially described as a new species—*L. parvula* Theodore, 1967, but was later synonymised with *L. fortisetosa* by Grunin (1970). Thereafter, a number of records have been published from Central and Eastern European countries (see Fig. 1 for details). However, no records of *L. fortisetosa* westwards from Switzerland, northwards from the Moscow region in Russia or southwards from Tuscany in Italy were hitherto known.

During recent years, several specimens of deer keds, collected from Estonia and morphologically distinct from the common *L. cervi*, have come into the authors' possession. Detailed investigation of these specimens, following the keys provided by Grunin (1970) and Büttiker (1994) and the differential diagnosis provided by Andreani et al. (2019), revealed them to be *L. fortisetosa*. This is the first time this species has been recorded from Estonia. Our study aims to investigate the morphological and molecular differences between *L. cervi* and *L. fortisetosa*, summarise the known distributions and provide the northernmost record of the latter.